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AUG 2001

L1 0 S BACTERIA? (P)(POLYA (W) POLYMSERASE?)
L2 0 S BACTERI? (P)(POLYA (W) POLYMSERASE?)
L3 0 S PROKARYOT? (P)(POLYA (W) POLYMSERASE?)

L5 ANSWER 84 OF 99 MEDLINE DUPLICATE 48
AN 77028872 MEDLINE
DN 77028872 PubMed ID: 789366
TI Further studies on the isolation and properties of polyriboadenylate polymerase from Escherichia **coli** PR7 (RNase I-, pnp).
AU Ramanarayanan M; Srinivasan P R
SO JOURNAL OF BIOLOGICAL CHEMISTRY, **(1976 Oct 25)** 251 (20) 6274-86.
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FS Priority Journals
EM 197612
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AB Polyriboadenylate polymerase was isolated from Escherichia **coli** PR7 (RNase I-, pnp) in good yield and high purity. The enzyme catalyzes the polymerization of ATP and ADP. These polymerizations show an initial lag which can be removed by the addition of poly(A). However, poly(A) does not function as a primer. UDP and CDP can also serve as substrates but with decreased efficiency. The polymerization of CDP is enhanced by the presence of an oligonucleotide which again does not function as a primer. Polymerization of [gamma-32P]ATP or [beta-32P]ADP result in products with no radioactivity. The product formed from [alpha-32P]ATP on hydrolysis with alkali yields labeled pAp and 2',3'-AMP; thus the enzyme synthesizes poly(A) chains de novo. During the polymerization of ATP, no burst of free ADP can be detected and the time course of phosphate release from ATP ro ADP follows very closely the kinetics of polymerization. dATP and dADP are effective inhibitors of poly(A) synthesis from either ATP or ADP. Sulfhydryl reagents inhibit only the polymerization of ATP and the inhibition is fully reversed by dithiothreitol. However, the enzyme can be protected from sulfhydryl reagents by preincubation with either ATP or ADP in the absence of Mg2+ which is required for polymerization. Studies using acrylamide gel electrophoresis indicate that the polymerization activity with either ATP or nucleoside diphosphates resides in the same protein. The enzyme catalyzes the following exchanges: 32Pi into ADP, 32Pi into ATP, and [14C] ADP into ATP in the presence of phosphate. While the enzyme catalyzes the phosphorolysis of its own product, (pAp-(Ap)nA), it fails to cleave the dephosphorylated product, (Ap(Ap)nA), or ribosomal RNA or tRNA in the presence of inorganic phosphate. The differences and similarities between **poly(A) polymerase** and polynucleotide phosphorylase are discussed. Based on the 32P exchange studies and other properties of **poly(A) polymerase**, a plausible mechanism for its action is proposed.

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